REMARKS

Claim Objections and Rejections

In the Office Action, the Examiner objected to Claims 1 and 4-8 because of the improper introduction of periods (“.”). This has been corrected, where necessary, in the above amendments. Claim 7 was objected to because of an inadvertently omitted phrase “transforming the plant with a nucleic acid having the sequence of”. This omission has also been corrected in the amendment. Applicants respectfully request that the Examiner withdraw the claim objections.

Claims 4, 8 and 9 were rejected under 35 U.S.C. §112, second paragraph. Claim 4 has been amended to inset “a nucleic acid that encodes” as suggested by the Examiner. The superfluous word “either” has been deleted from Claim 8. Claim 9 has been amended to introduce a positive step. This claim will be addressed below. Applicants respectfully request that the Examiner withdraw the claim rejections under 35 U.S.C. §112, second paragraph.

The Examiner also rejected Claims 4, 5, 6, 8 and 9 under 35 U.S.C. §112, first paragraph. Claims 4 and 6 were also rejected under 35 U.S.C. §103(a) as being unpatentable over Collinge et al. In Claim 4 the phrase referring to “80% sequence identity” has been deleted. A similar change has also been made to Claim 6. In claim 5 the phrase concerning the complementary nucleic acid has been deleted. In Claim 8 the claimed process now comprises the step of transforming the plant to overexpress a defined polypeptide. Claim 9 has also been amended, and that amendment is discussed below. In terms of Claims 4, 5, 6, and 8 Applicants believe that the rejections

under 35 U.S.C. §112, first paragraph and 35 U.S.C. §103(a) are now moot and respectfully request the Examiner to withdraw those claim rejections.

Claim 9

Applicants' attorney has discussed with the Examiner and the Examiner's Supervisor, Amy Nelson, the problem of overcoming the 35 U.S.C. §112, first paragraph claim rejections as a means to add some reasonable breadth to the claimed invention. Although Applicants have disclosed the central importance of CK β II subunits to alteration of circadian rhythms and the control of flowering, the specific disclosed nucleic acid and protein sequences belong to plant that is not of economic importance. It is likely that other plants of the Brassicaceae, some of which are of economic importance, share the exact sequence. However, even though the present disclosure shows how to isolate and clone a CK β II subunit and use it to control circadian rhythms, such use does not fall within the specific nucleic acid and protein sequence claims except in the case of *Arabidopsis*. This is a problem because the invention here is more than just a nucleic acid or protein sequence; it is the use of the sequences and appropriate homologous sequences. Originally, Applicants sought coverage for the broader invention by claiming a homology range based on the differences between known CK β II subunits because it was anticipated that the operational (i.e., homologous) sequences in other plant species would fall within this range. However, the Examiner pointed out that many other sequences that are non-functional would also fall within the claim. The Examiner and the Examiner's Supervisor also pointed out that to claim the genus of CK β II subunits to which the claimed sequence belongs, other sequence examples must be disclosed.

When considered in the proper species/genus relationship it has become apparent that since CKB3 is very similar to CKB1 and CKB2, the genus involved is most likely that of CK β II subunits. In that case a generic claim to the sequence is not possible as this genus is not new. However, as suggested by Dr. Nelson, the actual generic claim here is use of CK β II subunits to alter circadian rhythms. Applicants have demonstrated in this application and in the parent of this application (now U.S. Patent No. 6,388,172) that a central part of the circadian system in flowering plants is CCA1 and that CK β II subunits bind to and affect the phosphorylation of CCA1. Further, an increase in CKII activity alters circadian rhythms and that CK β II subunits are shown to increase CKII activity. Finally, transformation with a CK β II subunit gene can increase the activity of CKII and alter circadian rhythms.

In an earlier version of Claim 9 Applicants' attorney sought to express this as merely "changing activity of protein kinase CK2". As pointed out by the Examiner this wording is indefinite. Now the claim has been amended to read on the generic form of the invention: namely altering circadian rhythms by transforming a plant with a CK β II subunit gene to thereby alter the protein kinase within the plant. All the steps of obtaining and testing such genes have been disclosed. Interchangeability of CK β II subunits in several key tests has been demonstrated in the specification. The prior art discloses methods using complementation to discover these subunits and demonstrates that their properties are conserved over a huge evolutionary range. However, none of the prior art discloses or suggests that CK β II subunits can be used to alter circadian rhythms. The present inventors have made this invention and have earned patent coverage for it.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the

application, as amended, are requested. If for any reason the Examiner still finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles telephone number listed below to discuss the steps necessary for placing the application in condition for allowance.

You are hereby authorized to charge any fees due and refund any surplus fees to our Deposit Account No. 50-1796, referencing docket number 13054.02000.

Respectfully submitted,

REED SMITH CROSBY HEAFEY LLP

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